WE CLAIM:

1. A variable torsional damper rotatably supported for translating torque between a prime mover and the input of a transmission, said variable torsional damper comprising:

a torque input member operatively connected for rotation with the power take off of a prime mover, an output member operatively connected for rotation with the input to a transmission and a plurality of damping elements interposed between said input member and said output member, said damping members acting to translate torque between said input and said output members and to dampen torsional forces generated between the prime mover and the transmission; and

a magneto-rheological damper assembly disposed in parallel with said damping elements adapted to operatively vary the hysteresis between said input member and said output member of said variable torsional damper.

2. A variable torsional damper as set forth in claim 1 wherein said magneto-rheological damper assembly includes an inner disk assembly that is operatively supported by said input member and an outer disk assembly that is operatively supported by said output member such that said variable torsional damper is adapted to selectively add additional hysteresis to that provided by said damping members.

3. A variable torsional damper as set forth in claim 2 wherein said magneto-rheological damper assembly further includes magnetic coil assembly having a winding that is adapted to provide a magnetic field having two magnetic poles when selectively energized.

4. A variable torsional damper as set forth in claim 3 wherein said inner disk assembly further includes a riser portion and a flux-shaping ring, said flux-shaping ring mounted to said riser portion and operatively supported about said magnetic coil such that the magnetic lines of flux generated by said magnetic coil assembly flow through said flux-shaping ring.

5. A variable torsional damper as set forth in claim 4 wherein said outer disk assembly further includes a riser portion, a flux-channeling ring, and a flux-shaping ring, said flux-channeling ring mounted to said riser portion and said flux-shaping ring mounted to said flux-channeling ring, such that said flux-channeling ring and said flux-shaping ring operatively surround said flux shaping ring of said inner disk assembly thereby forming a magneto-rheological fluid cavity.

6. A variable torsional damper as set forth in claim 5 wherein said magneto-rheological fluid cavity retains magneto-rheological fluid such that said magneto-rheological fluid is influenced by the magnetic lines of flux generated by said magnetic field to cause a damping effect between said inner disk assembly and said outer disk assembly.

7. A variable torsional damper as set forth in claim 6 wherein said flux-shaping ring of said inner disk assembly further includes a two outer rings and a center ring, said outer rings formed of a magnetically permeable material and said center ring formed of a non-magnetically permeable material and adapted to block the generated magnetic lines of flux and cause them to flow through said two outer rings.

8. A variable torsional damper as set forth in claim 7 wherein said flux-shaping ring of said outer disk assembly further includes two outer rings and a center ring, said outer rings formed of a magnetically permeable material and said center ring formed of a non-magnetically permeable material, said center ring adapted to block the generated magnetic lines of flux and cause them to flow through said two outer rings.

9. A variable torsional damper as set forth in claim 8 wherein said flux-channeling ring of said outer disk assembly is formed of a magnetically permeable material that is adapted to cause the generated magnetic lines of flux to flow between said two magnetic poles of said magnetic coil assembly after flowing through said flux-shaping rings of said inner and said outer disk assemblies thereby providing a perpendicular flow of magnetic flux lines through said magneto-rheological fluid cavity.

10. A variable torsional damper as set forth in claim 9 wherein said inner disk assembly further includes a plurality of slots and said outer disk assembly further includes a like plurality of slots, each of said plurality of slots adapted to receive a like plurality of pushrods, said pushrods adapted to transfer force from a first throwout bearing to a second throwout bearing to cause the disengagement of said pressure plate.

11. A variable torsional damper rotatably supported for translating torque between a prime mover and the input of a transmission, said variable torsional damper comprising:

a torque input member operatively connected for rotation with the power take off of a prime mover, an output member operatively connected for rotation with the input to a

transmission and a plurality of damping members interposed between said input member and said output member, said damping members acting to translate torque between said input and said output members and to dampen torsional forces generated between the prime mover and the transmission; and

a magneto-rheological damper assembly having a magnetic coil assembly adapted to provide a magnetic field when selectively energized, an inner disk assembly that is operatively supported by said input member, an outer disk assembly that is operatively supported by said output member such that said magneto-rheological damper assembly is disposed in parallel with said damping members, and magneto-rheological fluid operatively disposed between said inner disk and said outer disk such that said magneto-rheological fluid is influenced by said magnetic field to cause additional hysteresis to be added to that provided by said damping members.

12. A variable torsional damper as set forth in claim 11 wherein said a magnetic coil assembly further includes a winding that is adapted to provide a selectively variable magnetic field having two magnetic poles when energized.

13. A variable torsional damper as set forth in claim 12 wherein said inner disk assembly further includes a riser portion and a flux-shaping ring, said flux-shaping ring mounted to said riser portion and operatively supported about said magnetic coil assembly such that the magnetic lines of flux generated by said magnetic coil assembly flow through said flux-shaping ring.

14. A variable torsional damper as set forth in claim 13 wherein said outer disk assembly further includes a riser portion, a flux-channeling ring, and a flux-shaping ring, said flux-channeling ring mounted to said riser portion and said flux-shaping ring mounted to said flux-channeling ring, such that said flux-channeling ring and said flux-shaping ring operatively surround said flux shaping ring of said inner disk assembly thereby forming a magneto-rheological fluid cavity.

15. A variable torsional damper as set forth in claim 14 wherein said magneto-rheological fluid cavity retains said magneto-rheological fluid such that said magneto-rheological fluid is influenced by the magnetic lines of flux generated by said two magnetic poles of said magnetic coil to cause a damping effect between said inner disk assembly and said outer disk assembly.

16. A variable torsional damper as set forth in claim 15 wherein said flux-shaping ring of said inner disk assembly further includes two outer rings and a center ring, said outer rings formed of a magnetically permeable material and said center ring formed of a non-magnetically permeable material and adapted to block the generated magnetic lines of flux and cause them to flow through said two outer rings.

17. A variable torsional damper as set forth in claim 16 wherein said flux-shaping ring of said outer disk assembly further includes two outer rings and a center ring, said outer rings formed of a magnetically permeable material and said center ring formed of a non-magnetically

permeable material, said center ring adapted to block the generated magnetic lines of flux and cause them to flow through said two outer rings.

18. A variable torsional damper as set forth in claim 17 wherein said flux-channeling ring of said outer disk assembly is formed of a magnetically permeable material that is adapted to cause the generated magnetic lines of flux to flow between the two poles of said magnetic coil assembly after flowing through said flux-shaping rings of said inner and said outer disk assemblies, thereby providing a perpendicular flow of magnetic flux lines through said magneto-rheological fluid cavity.

19. A variable torsional damper as set forth in claim 18 wherein said inner disk assembly further includes a plurality of slots and said outer disk assembly further includes a like plurality of slots, each of said plurality of slots adapted to receive a like plurality of pushrods, said pushrods adapted to transfer force from a first throwout bearing to a second throwout bearing to cause the disengagement of said pressure plate.

20. A variable torsional damper rotatably supported for translating torque between a prime mover and the input of a transmission, said variable torsional damper comprising:

a torque input member operatively connected for rotation with the power take off of a prime mover, an output member operatively connected for rotation with the input to a transmission and a plurality of damping members interposed between said input member and said output member, said damping members acting to translate torque between said input and said

output members and to dampen torsional forces generated between the prime mover and the transmission;

a magneto-rheological damper assembly having an inner disk assembly that is operatively supported by said input member, an outer disk assembly that is operatively supported by said output member such that said magneto-rheological damper assembly is disposed in parallel with said damping members, and a magnetic coil assembly that is adapted to provide a magnetic field when selectively energized;

said inner disk assembly and said outer disk assembly having flux shaping portions and forming a magneto-rheological fluid cavity that retains magneto-rheological fluid such that the magnetic lines of flux generated by said magnetic field are shaped by said flux shaping portions to cause said magneto-rheological fluid to be influenced by said magnetic lines of flux to selectively add additional hysteresis to that of the damping members.